Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: May 8 through May 30, 2003

LDC Report Date: July 29, 2003

Matrix: Water

Parameters: Chromium & Lead

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-3484

Sample Identification

Dupe-7-2Q03
EB-12-5/8/03
EB-13-5/13/03
MW-1
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-13
MW-15
MW-16
MW-18-1
MW-18-2
MW-18-3
MW-18-4
MW-18-5
MW-22-1
MW-22-2
MW-22-3
MW-22-4
MW-22-5
MW-6MS
MW-6MSD
MW-6DUP
MW-7MS
MW-7MSD
MW-7DUP
MW-22-1MS
MW-22-1MSD
MW-22-1DUP

Introduction

This data review covers 32 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 200.8 for Chromium & Lead.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Chromium	0.208 ug/L	All samples in SDG 03-3484

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check was not required by the method.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-22-1MS/MSD (Dupe-7-2Q03 EB-12-5/8/03 EB-13-5/13/03 MW-5 MW-6 MW-8 MW-10 MW-13 MW-15 MW-16 MW-18-1 MW-18-2 MW-18-3 MW-18-4 MW-18-5 MW-22-1 MW-22-2 MW-22-3 MW-22-4 MW-22-5)	Chromium	75 (80-120)	73.9 (80-120)	-	J (all detects) UJ (all non-detects)	A
MW-6MS/MSD (Dupe-7-2Q03 EB-12-5/8/03 EB-13-5/13/03 MW-5 MW-6 MW-8 MW-10 MW-13 MW-15 MW-16 MW-18-1 MW-18-2 MW-18-3 MW-18-4 MW-18-5 MW-22-1 MW-22-2 MW-22-3 MW-22-4 MW-22-5)	Chromium	77 (80-120)	78.3 (80-120)	-	J (all detects) UJ (all non-detects)	A

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

Samples Dupe-7-2Q03 and MW-18-4 were identified as field duplicates. No chromium or lead was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	Dupe-7-2Q03	MW-18-4	
Chromium	2.2	2.0	10

XIV. Field Blanks

Samples EB-12-5/8/03 and EB-13-5/13/03 were identified as equipment blanks. No chromium or lead contaminants were found in these blanks with the following exceptions:

Equipment Blank ID	Analyte	Concentration (ug/L)
EB-13-5/13/03	Chromium	1.1

NASA JPL
Chromium & Lead - Data Qualification Summary - SDG 03-3484

SDG	Sample	Analyte	Flag	A or P	Reason
03-3484	Dupe-7-2Q03 EB-12-5/8/03 EB-13-5/13/03 MW-5 MW-6 MW-8 MW-10 MW-13 MW-15 MW-16 MW-18-1 MW-18-2 MW-18-3 MW-18-4 MW-18-5 MW-22-1 MW-22-2 MW-22-3 MW-22-4 MW-22-5	Chromium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

NASA JPL
Chromium & Lead - Laboratory Blank Data Qualification Summary - SDG 03-3484

No Sample Data Qualified in this SDG

10609E

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Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-001 **Collection Date:** 5/8/2003 8:00:00 AM
Client Sample ID: MW-22-5 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: NS
Chromium	ND	1.0	UJ	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-002 **Collection Date:** 5/8/2003 8:40:00 AM
Client Sample ID: MW-22-4 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: NS
Chromium	2.4	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-003 **Collection Date:** 5/8/2003 9:25:00 AM
Client Sample ID: MW-22-3 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: NS
Chromium	ND	1.0	UJ	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

7/4/03

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-004 **Collection Date:** 5/8/2003 10:00:00 AM
Client Sample ID: MW-22-2 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	ND	1.0	UJ	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-005 **Collection Date:** 5/8/2003 11:05:00 AM
Client Sample ID: MW-22-1 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	1.9	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-006 **Collection Date:** 5/8/2003 8:50:00 AM
Client Sample ID: EB-12-5/8/03 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	ND	1.0	UJ	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

7/8/03

Qualifiers:

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- B - Analyte detected in the associated Method Blank
- * - Value exceeds Maximum Contaminant Level
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range
- H-Sample exceding holding time

Results are wet unless othewise specified

007

Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-007 **Collection Date:** 5/13/2003 8:10:00 AM
Client Sample ID: MW-18-5 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	ND MJ	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-008 **Collection Date:** 5/13/2003 9:25:00 AM
Client Sample ID: MW-18-4 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	2.0 J	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-009 **Collection Date:** 5/13/2003 10:10:00 AM
Client Sample ID: MW-18-3 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	5.4 J	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

7/8/03

Qualifiers:
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B - Analyte detected in the associated Method Blank
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

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Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-010 **Collection Date:** 5/13/2003 10:50:00 AM
Client Sample ID: MW-18-2 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS						
		EPA 200.8				
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	ND UJ	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-011 **Collection Date:** 5/13/2003 11:30:00 AM
Client Sample ID: MW-18-1 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS						
		EPA 200.8				
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	ND UJ	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-012 **Collection Date:** 5/13/2003 10:20:00 AM
Client Sample ID: EB-13-5/13/03 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS						
		EPA 200.8				
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	1.1 J	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

7/8 4/07

Qualifiers:
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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

009

Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-013 **Collection Date:** 5/13/2003
Client Sample ID: Dupe-72Q03 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	2.2	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-014 **Collection Date:** 5/27/2003 8:30:00 AM
Client Sample ID: MW-13 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	16	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-015 **Collection Date:** 5/27/2003 10:50:00 AM
Client Sample ID: MW-16 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	4.5	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

8/4/15

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

010

Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-016 **Collection Date:** 5/28/2003 8:30:00 AM
Client Sample ID: MW-5 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	3.1	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-017 **Collection Date:** 5/28/2003 11:15:00 AM
Client Sample ID: MW-8 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	1.4	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-018 **Collection Date:** 5/29/2003 10:25:00 AM
Client Sample ID: MW-6 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				**EPA 200.8**		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: **NS**
Chromium	7.1	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

7/4/03

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

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Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL; #3484

Lab ID: 063531-019 **Collection Date:** 5/29/2003 12:20:00 PM
Client Sample ID: MW-7 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702B	QC Batch: R28957			PrepDate:		Analyst: NS
Chromium	4.9	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-020 **Collection Date:** 5/29/2003 1:15:00 PM
Client Sample ID: MW-15 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: NS
Chromium	3.9	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-021 **Collection Date:** 5/30/2003 7:35:00 AM
Client Sample ID: MW-10 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702A	QC Batch: R28956			PrepDate:		Analyst: NS
Chromium	8.1	1.0	J	µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

7/4/03

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

012

Advanced Technology Laboratories

Date: *03-Jul-03*

CLIENT: Applied P & Ch Laboratories **Lab Order:** 063531
Project: JPL, #3484

Lab ID: 063531-022 **Collection Date:** 5/30/2003 9:50:00 AM
Client Sample ID: MW-1 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702B	QC Batch: R28957			PrepDate:		Analyst: NS
Chromium	2.4	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

Lab ID: 063531-023 **Collection Date:** 5/30/2003 11:50:00 AM
Client Sample ID: MW-9 **Matrix:** WATER

Analyte	Result	PQL	Qual	Units	DF	Date Analyzed
ICP-MS METALS				EPA 200.8		
RunID: ICP4_030702B	QC Batch: R28957			PrepDate:		Analyst: NS
Chromium	4.3	1.0		µg/L	1	7/2/2003
Lead	ND	1.0		µg/L	1	7/2/2003

8/4/03

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H-Sample exceding holding time

Results are wet unless othewise specified

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

LDC #: 10609E4
SDG #: 03-3484
Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 7-28-03
Page: 1 of 1
Reviewer: MG
2nd Reviewer: MM

METHOD: Lead and Chromium (EPA Method 200.8)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 5-8-03 through 5-30-03
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not required
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	N	Not required
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 1+17
XIV.	Field Blanks	SW	EB = 2*3

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; * = N.D.

Validated Samples: all water

1	Dupe-7-2Q03	11	MW-13	21	MW-22-3	31	MW-22-1MSD
2	EB-12-5/8/03	12	MW-15	22	MW-22-4	32	MW-22-1DUP
3	EB-13-5/13/03	13	MW-16	23	MW-22-5	33	PBW1
4 2	MW-1	14	MW-18-1	24	MW-6MS	34 2	PBW2
5	MW-5	15	MW-18-2	25	MW-6MSD	35	
6	MW-6	16	MW-18-3	26	MW-6DUP	36	
7 2	MW-7	17	MW-18-4	27 2	MW-7MS	37	
8	MW-8	18	MW-18-5	28 2	MW-7MSD	38	
9 2	MW-9	19	MW-22-1	29 2	MW-7DUP	39	
10	MW-10	20	MW-22-2	30	MW-22-1MS	40	

Notes:

LDC #: 10609E4
SDG #: 03-3484

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1→23	W	Al, Sb, As, Ba, Be, Cd, Ca, (Cr), Co, Cu, Fe, (Pb), Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
QC 24→32	↓	Al, Sb, As, Ba, Be, Cd, Ca, (Cr), Co, Cu, Fe, (Pb), Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP-MS	W	Al, Sb, As, Ba, Be, Cd, Ca, (Cr), Co, Cu, Fe, (Pb), Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___

Comments: Mercury by CVAA if performed

LDC #: 10609E4
SDG #: 03-3484

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MH

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: all (No findings)

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr			0.208	1.040											Cr
Cc															Co
Cu															Cu
Fe															Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Nl															Nl
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn															Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 10609E4
SDG #: 03-3484

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MG
2nd Reviewer: MH

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	30/31	water	Cr	75 (80-120)	73.9 (80-120)		(1→3, 5, 6, 8, 10→23)	J/UJ/A
2	24/25	water	Cr	77 (80-120)	78.3 (80-120)		↓	↓

Comments:

LDC #: 10609E4
SDG #: 03-3484

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: MG
2nd reviewer: MM

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (µg/L)		RPD (Limits)	Difference (Limits)	Qualifications
	1	17			
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium	2.2	2.0	10		
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					
Silicon					

Notes:

LDC #: 10609E4
SDG #: 03-3484

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: MG
2nd reviewer: MH

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Sample: 3 Field Blank / Trip Blank / Rinsate (Other) EB (circle one)

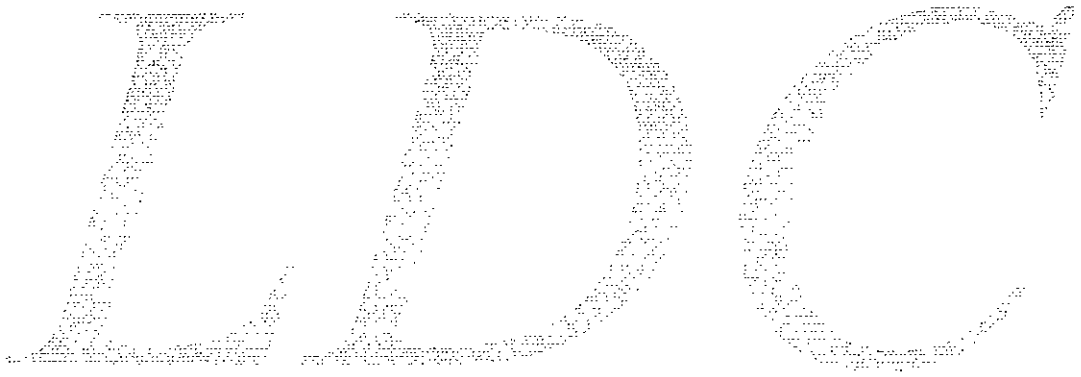
Analyte	Concentration Units (µg/L)
Cr	1.1

Sample: _____ Field Blank / Trip Blank / Rinsate / Other_____ (circle one)

Analyte	Concentration Units ( )

NASA JPL
Data Validation Reports
LDC# 10609

Wet Chemistry



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: May 27, 2003

LDC Report Date: July 29, 2003

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-3391

Sample Identification

MW-13
MW-16
MW-13MS
MW-13MSD
MW-13DUP

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 for Total Dissolved Solids, EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 314.0 for Perchlorate, EPA SW 846 Method 7196A for Hexavalent Chromium, EPA SW 846 Method 9040B for pH, and Standard Method 2320B for Alkalinity.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-3391

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-3391

No Sample Data Qualified in this SDG

Applied P & Ch Laboratory

Wet Analysis Results for Method SM2320B

Client Name: GEOFON, Inc.
Project ID: JPL
Project No: 04-4428.10
Service ID: 33391
Anal. Method SM2320B
Collected by:

Component Name: Carbonate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U
03-3391-2	MW-16	Water	05/27/03	05/27/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U
03W3113-MB-01	03W3113-MB-01	Water	06/02/03	06/02/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 9040B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 9040B
Project ID: JPL Service ID: 33391 Collected by:

Component Name: pH
CAS No: 10-29-7

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	05/27/03	03W3048	pH unit	0.01	7.00	
03-3391-2	MW-16	Water	05/27/03	05/27/03	05/27/03	03W3048	pH unit	0.01	7.18	
03W3048-MB-01	03W3048-MB-01	Water	05/27/03	05/27/03	05/27/03	03W3048	pH unit	0.01	6.82	

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 160.1

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 160.1
Project ID: JPL Service ID: 33391 Collected by:

Component Name: Solids, Total Dissolved (TDS)
CAS No: 10-33-3

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	05/29/03	03W3071	mg/L	10	529	
03-3391-2	MW-16	Water	05/27/03	05/27/03	05/29/03	03W3071	mg/L	10	347	
03W3071-MB-01	03W3071-MB-01	Water	05/29/03	05/29/03	05/29/03	03W3071	mg/L	10	<10	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

6/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 7196
Project ID: JPL Service ID: 33391 Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	05/27/03	03W3046	mg/L	0.01	0.024	
03-3391-2	MW-16	Water	05/27/03	05/27/03	05/27/03	03W3046	mg/L	0.01	<0.01	U
03W3046-MB-01	03W3046-MB-01	Water	05/27/03	05/27/03	05/27/03	03W3046	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 300.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 300.0
Project ID: JPL Service ID: 33391 Collected by:

Component Name: Chloride Cl^-
CAS No: 16887-00-6

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	1.6	52.8	
03-3391-2	MW-16	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	1	33.5	
03W3042-MB-01	03W3042-MB-01	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	0.2	<0.2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 300.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 300.0
Project ID: JPL Service ID: 33391 Collected by:

Component Name: Nitrate as N
CAS No: 14797-55-8

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	0.32	9.4	
03-3391-2	MW-16	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	0.2	9.5	
03W3042-MB-01	03W3042-MB-01	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	0.04	<0.04	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/05

Applied P & Ch Laboratory

Wet Analysis Results for Method 300.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 300.0
Project ID: JPL Service ID: 33391 Collected by:

Component Name: Sulfate SO_4^{--}
CAS No: 14808-79-8

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3391-1	MW-13	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	4	80.7	
03-3391-2	MW-16	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	2.5	33.7	
03W3042-MB-01	03W3042-MB-01	Water	05/27/03	05/27/03	05/27/03	03W3042	mg/L	0.5	<0.5	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

LDC #: 10609A6

SDG #: 03-3391

Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 7-25-03

Page: 1 of 1

Reviewer: MG

2nd Reviewer: MG

METHOD: (Analyte) Alkalinity (Standard Method 2320B), Chloride, Sulfate, and Nitrate as N (EPA Method 300.0), Perchlorate (EPA Method 314.0), Total Dissolved Solids (EPA Method 160.1), pH (EPA SW846 Method 9040B), Hexavalent Chromium (EPA SW846 Method 7196A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 5-27-03
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MW-7 MS/MSD (SDG: 03-3444)
V	Duplicates	A	MW-6 DUP (↓)
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

1	MW-13 W	11		21		31	
2	MW-16	12		22		32	
3	MW-13MS	13		23		33	
4	MW-13MSD	14		24		34	
5	MW-13DUP	15		25		35	
6	PBW	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 10609A6
SDG #: 03-3391

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer: MH

All circled methods are applicable to each sample.

Sample ID	Parameter
1 → 2	(pH) (TDS) (Cl) F (NO3) NO2 (SO4) PO4 (ALK) CN NH3 TKN TOC (Cr6+) (ClO4) ____ ____ ____
QC 3, 4	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (Cr6+) ____ ____ ____ ____
↓ 5	(pH) TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC Cr6+ ____ ____ ____ ____

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: May 28, 2003

LDC Report Date: July 29, 2003

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-3414

Sample Identification

MW-5
MW-8
MW-5MS
MW-5MSD
MW-8DUP

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 for Total Dissolved Solids, EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 314.0 for Perchlorate, EPA SW 846 Method 7196A for Hexavalent Chromium, EPA SW 846 Method 9040B for pH, and Standard Method 2320B for Alkalinity.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-3414

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-3414

No Sample Data Qualified in this SDG

B

Applied P & Ch Laboratory

Wet Analysis Results for Method SM2320B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method SM2320B
Project ID: JPL Service ID: 33414 Collected by:

Component Name: Bicarbonate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	06/02/03	03W3113	mg/L	2	146	
03-3414-2	MW-8	Water	05/28/03	05/28/03	06/02/03	03W3113	mg/L	2	153	
03W3113-MB-01	03W3113-MB-01	Water	06/02/03	06/02/03	06/02/03	03W3113	mg/L	2	<2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

6/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method SM2320B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method SM2320B
Project ID: JPL Service ID: 33414 Collected by:

Component Name: Carbonate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	< 2	U
03-3414-2	MW-8	Water	05/28/03	05/28/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	< 2	U
03W3113-MB-01	03W3113-MB-01	Water	06/02/03	06/02/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	< 2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 9040B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 9040B
Project ID: JPL Service ID: 33414 Collected by:

Component Name: pH
CAS No: 10-29-7

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/28/03	03W3065	pH unit	0.01	6.84	
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/28/03	03W3065	pH unit	0.01	7.00	
03W3065-MB-01	03W3065-MB-01	Water	05/28/03	05/28/03	05/28/03	03W3065	pH unit	0.01	6.86	

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

6/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 160.1

Client Name:	GEOFON, Inc.	Project No:	04-4428.10	Anal. Method	160.1
Project ID:	JPL	Service ID:	33414	Collected by:	

Component Name: Solids, Total Dissolved (TDS)
CAS No: 10-33-3

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/29/03	03W3071	mg/L	10	263	
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/29/03	03W3071	mg/L	10	277	
03W3071-MB-01	03W3071-MB-01	Water	05/29/03	05/29/03	05/29/03	03W3071	mg/L	10	<10	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc.
Project ID: JPL

Project No: 04-4428.10
Service ID: 33414

Anal. Method 7196
Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/28/03	03W3063	mg/L	0.01	< 0.01	U
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/28/03	03W3063	mg/L	0.01	< 0.01	U
03W3063-MB-01	03W3063-MB-01	Water	05/28/03	05/28/03	05/28/03	03W3063	mg/L	0.01	< 0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

Applied P & Ch Laboratory

Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0
Project ID: JPL Service ID: 33414 Collected by:

Component Name: Perchlorate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/29/03	03W3074	µg/L	4	<4	U
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/29/03	03W3074	µg/L	4	4.2	
03W3074-MB-01	03W3074-MB-01	Water	05/29/03	05/29/03	05/29/03	03W3074	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/05

Applied P & Ch Laboratory

Wet Analysis Results for Method 300.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 300.0

Project ID: JPL Service ID: 33414 Collected by:

Component Name: Chloride Cl^-

CAS No: 16887-00-6

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.4	9.0	
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.4	14.1	
03W3052-MB-01	03W3052-MB-01	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.2	<0.2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

6/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 300.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 300.0
Project ID: JPL Service ID: 33414 Collected by:

Component Name: Nitrate as N
CAS No: 14797-55-8

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.08	2.3	
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.08	1.4	
03W3052-MB-01	03W3052-MB-01	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.04	< 0.04	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

F 8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 300.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 300.0
Project ID: JPL Service ID: 33414 Collected by:

Component Name: Sulfate SO_4^{--}
CAS No: 14808-79-8

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3414-1	MW-5	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	1	22.1	
03-3414-2	MW-8	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	1	36.4	
03W3052-MB-01	03W3052-MB-01	Water	05/28/03	05/28/03	05/28/03	03W3052	mg/L	0.5	<0.5	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

F 8/4/03

LDC #: 10609B6

SDG #: 03-3414

Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 7-25-03

Page: 1 of 1

Reviewer: MG

2nd Reviewer: MG

METHOD: (Analyte) Alkalinity (Standard Method 2320B), Chloride, Sulfate, and Nitrate as N (EPA Method 300.0), Perchlorate (EPA Method 314.0), Total Dissolved Solids (EPA Method 160.1), pH (EPA SW846 Method 9040B), Hexavalent Chromium (EPA SW846 Method 7196A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 5-28-03
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MW-6 MS/MSD (SDG: 03-3444)
V	Duplicates	A	MW-6 DUP (↓)
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	MW-5 W	11		21		31	
2	MW-8	12		22		32	
3	MW-5MS	13		23		33	
4	MW-5MSD	14		24		34	
5	MW-8DUP	15		25		35	
6	PBW	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 106098G
SDG #: 03-3414

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer: MH

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 2	(pH) (TDS) (Cl) F (NO3) NO2 (SO4) PO4 (ALK) CN NH3 TKN TOC (CR6+) (ClO4)
QC 3, 4	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC (CR6+)
↓ 5	(pH) TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+
	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: May 29, 2003

LDC Report Date: July 29, 2003

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-3444

Sample Identification

MW-6
MW-7
MW-15
MW-6MS
MW-6MSD
MW-7MS
MW-7MSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 for Total Dissolved Solids, EPA Method 300.0 for Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 314.0 for Perchlorate, EPA SW 846 Method 7196A for Hexavalent Chromium, EPA SW 846 Method 9040B for pH, and Standard Method 2320B for Alkalinity.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-3444

No Sample Data Qualified in this SDG

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-3444

No Sample Data Qualified in this SDG

C

Applied P & Ch Laboratory

Wet Analysis Results for Method SM2320B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method SM2320B
Project ID: JPL Service ID: 33444 Collected by:

Component Name: Bicarbonate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3444-1	MW-6	Water	05/29/03	05/29/03	06/02/03	03W3113	mg/L	2	284	
03-3444-2	MW-7	Water	05/29/03	05/29/03	06/02/03	03W3113	mg/L	2	124	
03-3444-3	MW-15	Water	05/29/03	05/29/03	06/02/03	03W3113	mg/L	2	194	
03W3113-MB-01	03W3113-MB-01	Water	06/02/03	06/02/03	06/02/03	03W3113	mg/L	2	<2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

7/8/4/07

Applied P & Ch Laboratory

Wet Analysis Results for Method SM2320B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method SM2320B
Project ID: JPL Service ID: 33444 Collected by:

Component Name: Carbonate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3444-1	MW-6	Water	05/29/03	05/29/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U
03-3444-2	MW-7	Water	05/29/03	05/29/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U
03-3444-3	MW-15	Water	05/29/03	05/29/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U
03W3113-MB-01	03W3113-MB-01	Water	06/02/03	06/02/03	06/02/03	03W3113	mg-$CaCO_3$/L	2	<2	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

Applied P & Ch Laboratory

Wet Analysis Results for Method 9040B

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 9040B
Project ID: JPL Service ID: 33444 Collected by:

Component Name: pH
CAS No: 10-29-7

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3444-1	MW-6	Water	05/29/03	05/29/03	05/29/03	03W3085	pH unit	0.01	6.63	
03-3444-2	MW-7	Water	05/29/03	05/29/03	05/29/03	03W3085	pH unit	0.01	7.18	
03-3444-3	MW-15	Water	05/29/03	05/29/03	05/29/03	03W3085	pH unit	0.01	7.00	
03W3085-MB-01	03W3085-MB-01	Water	05/29/03	05/29/03	05/29/03	03W3085	pH unit	0.01	6.88	

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

8/4/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 160.1

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 160.1
Project ID: JPL Service ID: 33444 Collected by:

Component Name: Solids, Total Dissolved (TDS)
CAS No: 10-33-3

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-3444-1	MW-6	Water	05/29/03	05/29/03	05/30/03	03W3098	mg/L	10	812	
03-3444-2	MW-7	Water	05/29/03	05/29/03	05/30/03	03W3098	mg/L	10	314	
03-3444-3	MW-15	Water	05/29/03	05/29/03	05/30/03	03W3098	mg/L	10	329	
03W3098-MB-01	03W3098-MB-01	Water	05/30/03	05/30/03	05/30/03	03W3098	mg/L	10	<10	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

6/8/4105